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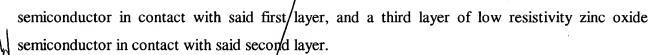
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What is claimed is:

A process for making a thin film heterojunction photovoltaic device comprising the steps of:

- (a) depositing a first film of p-type copper indium diselenide film on a metal back contact;
- (b) depositing on the upper surface of the copper indium diselenide film a group II(a,b) and VII elemental salt;
- (c) converting the p-type the upper copper indium diselenide film surface n-type by thermal diffusion of the salt into the copper indium diselenide film;
- (d) depositing a second thin film layer of high resistivity zinc oxide; and
- (e) depositing a third film of n-type transparent zinc oxide on the second thin film high resistivity zinc oxide layer.
- 2. A process according to claim I in which the group II(a,b) and VII elemental salt is zinc chloride.
- 3. A process according to claim 2 wherein zinc chloride is deposited on the copper indium diselenide film surface from solid zinc chloride in a vapor phase through sublimation.
- 4. A process according to claim 2 wherein zinc chloride is deposited on the copper indium diselenide film surface from a zinc chloride solution by chemical vapor deposition.
- 5. A process according to claim 4 wherein the zinc chloride solution comprises zinc chloride in methanol.

 1 and I halide
- 6. A process according to claim I wherein the elemental sale and copper indium disclenide are thermally diffused at 190-220°C.
- 7. A process according to claim wherein the elemental salt and copper indium disclenide are heated in contact for 10-60 minutes.
 - A process according to claim I further comprising cleaning the n-type converted copper indium diselenide film surface with deionized water and etching with dilute hydrochloric acid.
- 9. A process according to claim 8 wherein the hydrochloric acid solution is 10% hydrochloric acid in water.
 - A thin film photovoltaic device comprising, in order, a first layer of p-type copper indium diselenide semiconductor having a type converted upper region rendered n-type by thermal diffusion of a group II(a,b) and VII elemental salt, a second layer of high resistivity zinc oxide



11. A device according to claim 10, wherein the group II(a,b) and VII elemental salt is zinc chloride.